

Claims

1 1. A microelectrode comprising an upper surface, two walls, and a polymer
2 core, each of the two walls forming an angle with a lower surface, wherein the upper
3 surface and each of the two walls comprise a metal thin film in contact with the polymer
4 core, and the lower surface lacks a continuous metal thin film.

1 2. The microelectrode of Claim 1, wherein the polymer core comprises a
2 linear polymer, a crosslinked polymer, an organically modified sol-gel, or any
3 combination thereof.

1 3. The microelectrode of Claim 1, wherein the lower surface comprises
2 silicon dioxide.

1 4. The microelectrode of Claim 1, wherein the lower surface comprises a
2 polymer.

1 5. The microelectrode of Claim 4, wherein the lower surface comprises a
2 linear polymer, a crosslinked polymer, an organically modified sol-gel, or any
3 combination thereof.

1 6. The microelectrode of Claim 1, wherein the polymer core and the lower
2 surface comprise the same polymer.

1 7. The microelectrode of Claim 1, wherein the upper surface and the lower
2 surface are substantially parallel.

1 8. The microelectrode of Claim 1, wherein the angle between the two walls
2 and the lower surface is about 90 degrees.

1 9. The microelectrode of Claim 1, wherein the metal thin film is selected
2 from the group consisting of gold, platinum, titanium, and any combination thereof.

1 10. The microelectrode of Claim 1, wherein the metal thin film has a thickness
2 of about 100 nm to about 5 μm .

1 11. The microelectrode of Claim 1, wherein the width of the upper surface is
2 about 2 μm to about 500 μm and the height of the two walls is about 200 nm to about 10
3 μm .

1 12. The microelectrode of Claim 11, wherein the length of the microelectrode
2 is about 2 μm to about 200 mm.

1 13. A microelectrode array, comprising the microelectrode of Claim 1.

1 14. The microelectrode array of Claim 13, wherein the microelectrodes are
2 interdigitated.

1 15. A microelectrode comprising a metal thin film, the metal thin film having
2 a thickness and a plane bisecting the thickness, the plane forming an angle with a lower
3 surface, wherein: the metal thin film is in contact with a supporting polymer, the
4 supporting polymer having an upper surface; the lower surface lacks a continuous metal
5 thin film; and the upper surface lacks a continuous metal thin film.

1 16. The microelectrode of Claim 15, wherein the supporting polymer
2 comprises a linear polymer, a crosslinked polymer, an organically modified sol-gel or any
3 combination thereof.

1 17. The microelectrode of Claim 15, wherein the lower surface comprises
2 silicon dioxide.

1 18. The microelectrode of Claim 15, wherein the lower surface comprises a
2 polymer.

1 19. The microelectrode of Claim 18, wherein the lower surface comprises a
2 linear polymer, a crosslinked polymer, an organically modified sol-gel, or any
3 combination thereof.

1 20. The microelectrode of Claim 15, wherein the supporting polymer and the
2 lower surface comprise the same polymer.

1 21. The microelectrode of 15, wherein the angle between the plane bisecting
2 the thickness and the lower surface is about 90 degrees.

1 22. The microelectrode of Claim 15, wherein the metal thin film is selected
2 from the group consisting of gold, platinum, titanium, and any combination thereof.

1 23. The microelectrode of Claim 15, wherein the metal thin film has a
2 thickness of about 100 nm to about 5 μ m.

1 24. The microelectrode of Claim 15, wherein the width of the metal thin film
2 is about 200 nm to about 10 μ m.

1 25. The microelectrode of Claim 15, wherein the length of the microelectrode
2 is about 2 μ m to about 200 mm.

1 26. A microelectrode array, comprising the microelectrode of Claim 15.

1 27. The microelectrode array of Claim 26, wherein the microelectrodes are
2 interdigitated.